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Part IV

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Office of the Secretary

Preliminary Finding of Need To Accredit Laboratories That Provide Electromagnetic Calibration Services

DEPARTMENT OF COMMERCE

Office of the Secretary

National Voluntary Laboratory Accreditation Program; Preliminary Finding of Need of Accredit Laboratories That Provide Electromagnetic Calibration Services

AGENCY: Assistant Secretary of Commerce for Productivity, Technology, and Innovation.

ACTION: Request for comments on the preliminary finding of need to accredit laboratories that provide electromagnetic calibration services.

SUMMARY: Under the procedures of the National Voluntary Laboratory Accreditation Program (NVLAP) (15 CFR Parts 7a, 7b, and 7c), this notice announces the Department of Commerce's preliminary finding of need to accredit testing laboratories that provide electromagnetic calibration services. The set of standards and test methods initially proposed for inclusion in this laboratory accreditation program (LAP) would be limited to a specific set or group of electromagnetic measurements based upon the formal request for this LAP from Weinschel Engineering. This notice sets out the basis for the preliminary finding of need, including how accreditation of laboratories that provide electromagnetic calibration services would benefit the public interest and why there is a national need to accredit such laboratories. Comments are invited.

DATES: Written comments are due on or before October 6, 1980. A request for an informal hearing may be made before August 21, 1980.

FOR FURTHER INFORMATION CONTACT: Dr. Howard I. Forman, Deputy Assistant Secretary for Product Standards Policy, Room 3876, U.S. Department of Commerce, Washington, D.C. 20230 (202) 377–3221.

SUPPLEMENTARY INFORMATION:

Background

The procedures for the operation of the National Voluntary Laboratory Accreditation Program (NVLAP) were announced in the **Federal Register** on February 26, 1976 (41 FR 8163–8168, 15 CFR Part 7 which has been recently redesignated 15 CFR Part 7a). That notice, amended by publication in the **Federal Register** on March 9, 1979 (44 FR 12982–12990 designated 15 CFR Part 7b), on April 25, 1979 (44 FR 24274–24282 designated 15 CFR Part 7c), and on April 21, 1980 (45 FR 26993–26994), described the program as providing a national voluntary system to examine, upon request, the professional and technical competence of private and public testing laboratories that serve regulatory and non-regulatory product evaluation and certification needs. The program will accredit those laboratories that meet the qualifications established under these procedures

Section 7a.4(b) of the NVLAP procedures sets out the requirements to be met by those persons who seek to have the Department of Commerce (DoC) find that there is a need to accredit testing laboratories which provide services relating to a specific product. By letter of February 23, 1977, Bruno O. Weinschel of Weinschel Engineering, Gaithersburg, Maryland, requested DoC to find that there is a need to accredit testing laboratories which provide electromagnetic calibration services for instruments and measurement standards which operate at microwave frequencies. Weinschel Engineering manufactures and sells radio frequency attenuators and attenuation measuring systems, sweep frequency signal generators, microwave power measuring equipment, and power and attenuation standards.

The processing of this request was postponed initially due to a lack of resources. Subsequently, careful consideration was given to the development of a laboratory accreditation program (LAP) under Federal agency (Part 7b) NVLAP procedures and accommodating the request within a possible Federal agency request for a LAP encompassing these calibration services. The National Bureau of Standards (NBS) provides such calibration services. The Part 7b procedures upon which this alternative approach was considered were promulgated on March 9, 1979. In a September 6, 1979 memorandum, John W. Locke, Coordinator of NVLAP, requested guidance from James R. Wright, Deputy Director of the National Engineering Laboratory, on whether NBS might desire to initiate a LAP on calibration services. In a December 18, 1979 memorandum to Mr. Locke, Dr. Wright advised that NBS recommended the use of the General (Part 7a) NVLAP procedures so that the need for the proposed LAP could be established through public debate among interested parties. In that same memorandum, shortcomings in the request were identified which needed to be modified before proceeding with the preparation of a **Federal Register** notice of a preliminary finding of need. In a letter of January 2, 1980, Howard I. Forman, Deputy Assistant Secretary for Product Standards Policy, asked Dr. Weinschel to supply some additional information responding to Dr. Wright's comments. After further informal discussion between representatives of Weinschel Engineering and the NVLAP staff, Dr. Weinschel submitted a letter on May 14, 1980 to clarify and support his original request. For the purposes of analysis, this letter and the original request letter of February 23, 1977 represent the formal request submitted to comply with section 7a.4(b) of the NVLAP procedures.

This request has been analyzed and evaluated, resulting in a preliminary finding of need to establish a LAP for electromagnetic calibration services as set forth at the conclusion of this notice.

Request for Comments

Interested persons desiring to comment on the preliminary finding of need are invited to submit their comments on or before September 6, 1980, to the Assistant Secretary for Productivity, Technology and Innovation, U.S. Department of Commerce, Room 3864, Washington, D.C. 20230.

Any person desiring to express his or her views in an informal public hearing relative to this preliminary finding of need must do so by communicating that desire in writing on or before August 21, 1980, to the Assistant Secretary for Productivity, Technology, and Innovation. Upon receipt of such a request, informal public hearings will be held to give all interested persons an opportunity to orally present data, views, or arguments in addition to the opportunity to make written submissions. If deemed appropriate, hearings may be held at two locations, one of which will be east of the Mississippi River and the other west thereof. Notice of any hearings will be published in the **Federal Register** at least 20 days in advance thereof. A transcript will be made of any oral presentations.

Comments are invited particularly to determine whether there is a need to establish a LAP for "electromagnetic calibration services." The specific standards and test methods identified by the requestor would be included in the LAP. As a result of comments in response to this preliminary finding of need, additional standards and test methods directly related to electromagnetic calibration services could be included.

Procedure Following Receipt of Comments

Upon receipt of all written and oral comments and testimony, a thorough evaluation of the comments and testimony will be undertaken. Upon completion of that evaluation, a notice will be published in the **Federal Register** announcing a final finding of need to accredit testing laboratories which provide "electromagnetic calibration services," or announcing withdrawal of the preliminary finding of need. The notice will set out the basis for a final finding of need or for the withdrawal of the preliminary finding of need.

If a final finding of need is published, the NVLAP procedures call for the establishment of a National Laboratory Accreditation Criteria Committee for calibration services or use of an existing committee. Since there is no existing criteria committee with expertise in this area, a new committee would have to be formed. In accordance with the Federal Advisory Committee Act (Pub. L. 92–463), a charter setting forth the objectives and scope of the committee's activity, a description of the duties for which the committee is responsible, and an estimated number and frequency of committee meetings would be prepared. The NVLAP procedures require that a separate notice be published in the **Federal Register** announcing DoC's intention to form such a committee simultaneously with the publication of any final finding of need. Furthermore, the separate notice would outline the size and basis for selection of the committee members. Comments on the objectives and scope of the Committee and on the size and basis for selection of the members of the committee are also invited at this time.

Documents in Public Record

The documents mentioned or otherwise referenced in this notice are part of the public record and are available for inspection and copying in DoC's Central Reference and Records Inspection Facility (CRRIF), Room 5317, Main Commerce Building, 14th Street between E Street and Constitution Avenue, NW., Washington, D.C. 20230.

All written and oral comments and testimony in response to this notice will be made part of the public record and will be available for inspection and copying at CRRIF.

Issued: August 1, 1980.

Howard I. Forman,

Acting Assistant Secretary for Productivity, Technology and Innovation.

Preliminary Finding of Need

The request of Weinschel Engineering that DoC find that there is a need to accredit testing laboratories which provide electromagnetic calibration services has been carefully considered. The analysis of the request is contained in the report entitled "NVLAP Summary and Analysis Report, Electromagnetic Calibration Services."

Identification of the Product (Section 7a.4(b)(1))

The requestor identified the product (as defined in section 7a.3(a)) as electromagnetic calibration services for instruments and measurements standards which operate at microwave frequencies. The request is limited to calibration services for microwave power and attenuation measurements. The instruments for the power measurements include bolometric power meters, bolometric detectors, bolometric units, bolometric mounts and bolometric-coupler units. The instruments for the attenuation measurements include fixed and variable attenuators.

NVLAP procedures allow standards and test methods to be added to a LAP once a LAP is established if the standards and test methods fall within the boundaries established by the definition of the product for the LAP. The specific standards and test methods identified by the requestor would be included in the LAP. At some future date, or even as a result of comment in response to this preliminary finding of need, additional standards and test methods directly related to electromagnetic calibration services could be included.

Text of Applicable Standards and Test Methods (Section 7a.4(b) (2) and (3))

The requestor identified the applicable standards and test methods as those given in the Institute for Electrical and Electronic Engineers (IEEE) documents IEEE–STD–470–1972, "IEEE Standard Application Guide for Bolometric Power Meters" and "IEEE–STD–474–1973", "IEEE Standard Specifications and Test Methods for Fixed and Variable Attenuators, DC to 40 GHz." As noted in the identification of the product, the electromagnetic calibration services would be limited to microwave power and attenuation measurements. The requestor suggests specific ranges and uncertainties for these measurements. If this LAP is established, laboratories will be accredited for a specific range of measurements with a specified uncertainty within the capability of the equipment possessed by each laboratory. Of course, the range and uncertainty for which DoC will grant accreditation cannot exceed the capability of NBS. It is essential that an accredited laboratory's reference standards be traceable to the appropriate national standards of measurement. In this context traceability means that each instrument used for calibration purposes has itself been calibrated against an instrument of higher quality to the level at which the higher quality instrument is the accepted national standard. The limits of range and uncertainty which would be available for each measurement area offered in the LAP would be established by the DoC based upon advice from the advisory committee to be organized if a final finding of need is determined. The requestor's suggestions, pertinent comments from the public, NBS expertise, as well as the expertise of the committee members themselves would provide the input for determining ranges and uncertainties.

Basis of Need (Section 7a.4(b)(4))

The requestor includes in his request information addressing each of the five items set out in section 7a.5 of the NVLAP procedures. This information is incorporated into the discussion under the section of this notice entitled, *"Basis for Preliminary Finding of Need for Accrediting Laboratories That Provide Electromagnetic Calibration Services (Section 7a.5)."*

Number of Laboratories and Users (Sections 7a.4(b)(4) (i) and (ii))

The requestor provided a list of 69 industry and 15 government laboratories which perform calibration services at radio and microwave frequencies and claimed that these laboratories have a potential need for accreditation or would be users of accredited laboratories. These laboratories are listed in the 1975 edition of the "Directory of Standards Laboratories" prepared by the National Conference of Standards Laboratories (NCSL). The 1979 edition of the NCSL directory lists about 160 industry and 25 government laboratories capable of performing calibration services at radio and microwave frequencies.

The requestor asserted that the number of users which would desire the services of accredited laboratories is difficult to determine, but potentially includes all electronic equipment manufacturers and users. No listing of

users of those laboratories which provide calibration on a fee basis was available to the requestor. However, the requestor indicated that NBS, as of 1977, calibrated about 325 reference standards or instruments per year for electromagnetic quantities. More recent data indicates that NBS calibrates about 300–400 reference standards per year.

In view of the above information, it is concluded that the submitted request meets the requirements of section 7a.4 of the NVLAP procedures.

Basis of Preliminary Finding of Need for Accrediting Laboratories That Provide Electromagnetic Calibration Services (Section 7a.5)

The basis for this preliminary finding of need, keyed to the information items listed in section 7a.5 of the NVLAP procedures, is as follows:

(1) *Whether the establishment of general or specific criteria and other conditions for accrediting testing laboratories that provide electromagnetic calibration services would benefit the public interest (section 7a.5(a)).* Criteria and other requirements for accrediting laboratories would benefit the public interest by—

(a) Providing a measure of assurance for tests of conformance with accepted standards;

(b) assuring a common basis for quantitative measures of conformance with these standards;

(c) providing a mechanism for assurance that measurements and calibrations made by the private sector are equivalent to those made by government laboratories; and

(d) addressing regulatory concern for the accuracy of test results in certain consumer product and environmental areas.

(2) *Whether there is a national need to accredit testing laboratories for electromagnetic calibration services beyond that served by any existing laboratory accreditation programs in the public and private sector (section 7a.5(b)).* Although NBS has provided calibration services for over 70 years, the tremendous growth of the industry particularly in the electrical and electronics area has forced NBS progressively to restrict its services to non-routine measurements, then to measurement standards only, and then to measurement laboratory reference standards only. These restrictions have required establishment of additional calibration levels which increase the uncertainties and the number of calibration laboratories, thereby reducing the efficiency of resource utilization. Facilities are no longer readily available to obtain measurements of electromagnetic devices (other than reference standards traceable to a common national standard) without maintaining a calibration facility equivalent to that of a national laboratory. The Department of Defense (DoD) has established such facilities, but they are not available to non-Defense contractors. The need for an alternative to having calibration services provided by NBS exists in instances where the cost, time, or uncertainty of NBS services is too great, where the service is not available from NBS, when the number of calibrations to be made exceeds the resource capabilities of NBS, or when the shipping of sensitive instruments to NBS is impractical because of possible damage to such instruments. The need for accreditation is dependent upon the scope of calibration services available from NBS. NBS does not disagree with the requestor's assertion regarding the scope of the calibration services it offers in the microwave spectrum.

Calibration is the cornerstone on which all other measurements rest. Without properly executed calibrations, quality test data cannot be produced. The validity and reliability of the calibration chain (i.e., traceability to national standards) must be affirmed. Thus, the need for a formal means of developing and recognizing competent laboratories that provide certain types of calibration services seems indicated. The National Association of Testing Authorities (NATA) of Australia considers the accreditation of a full range of calibration services to be a major factor in improving the quality of testing provided by Australia's laboratories. In announcing the establishment of the British Calibration Service, the British government published the following:

> "The state of measurement science and practice in a country is one of the surest signs of its technical efficiency. Modern industrial technology depends on accurate measurement. The country requires both a comprehensive system of national standards of measurement, tied to the recognized international standards, and also facilities for checking, or calibrating measuring instruments and other test gear against such standards so that their accuracy can be authenticated."

Based on the experience of these and other countries' systems, a system of accrediting laboratories to perform calibration services in this country appears desirable. International recognition of our nation's laboratories may depend upon the validity and reliability of our calibration chain.

NBS does offer measurement assurance programs (MAPs), but these programs do not include evaluation of a laboratory against specified criteria. MAPs relate only to an assessment of results obtained by the laboratories when measuring reference materials and are generally restricted to primary international standard (SI) units. In effect, a MAP is similar to the proficiency testing requirements of a LAP which represent only one of three elements used to evaluate the competence of a laboratory. Further, participation in a MAP does not provide formal recognition.

(3) *Whether for electromagnetic calibration services, there is in existence a standard important to commerce, consumer well-being, or public health and safety (Section 7a.5(c)).* Many standards requiring electromagnetic calibration services are important to commerce, consumer well-being, and the public health and safety. The requestor identified standards developed by several organizations, including the Federal Communications Commission (FCC), and the Occupational Safety and Health Administration (OSHA), and provided a brief statement indicating the benefit of each set of standards established by these organizations. Specific parts of the FCC Rules and Regulations were cited which indicate the importance placed upon power and attenuation measurements particularly on radio frequency devices to assure compliance with FCC standards. Also, the requestor identified the specific subsection of OSHA regulations entitled "Nonionizing Radiation," which defines radio frequency and microwave radiation levels that should not be exceeded. Both the FCC and OSHA regulations indicate that the IEEE standards are acceptable for use in power and attenuation measurements. Thus, assuring the quality of measurements in these areas is deemed important to commerce, consumer well-being, and the public health and safety.

(4) *Whether there is in existence a valid testing methodology (Section 7a.5(d)).* The IEEE standards identified by the requestor provide test methods (i.e., calibration procedures) for use in calibrating electromagnetic power and attenuation measuring instruments. If any requests are received to add other standards and test methods to this LAP and if a final finding of need is established, they will be carefully reviewed for possible addition to the LAP.

(5) *Whether it is feasible and practical to accredit testing laboratories*

that provide electromagnetic calibration services (Section 7a.5(e)). DoC is not aware of any characteristic of the IEEE standards or of laboratories in which such calibrations would typically be performed as would make an electromagnetic calibration services LAP less feasible and practical than the other LAPs now in the program. The requestor claimed that the MAPs offered by NBS provide a mechanism which makes it feasible and practical to accredit testing laboratories for calibration services. Such MAPs are comparable to proficiency testing programs in that they help laboratories check their traceability to primary standards. If available, a MAP can and probably would be employed in this proposed LAP as an accreditation requirement. Based on this NBS experience, it is deemed feasible and practical to accredit testing laboratories that provide electromagnetic calibration services.

Preliminary Finding of Need

The request to find that there is a need to accredit testing laboratories that provide electromagnetic calibration services has been carefully examined and analyzed. Based on that examination and analysis, which are described above, it is preliminarily found that a need exists to accredit testing laboratories that provide electromagnetic calibration services. It is proposed that if a final finding of need is determined this LAP would initially include the two IEEE standards identified by the requestor as IEEE–STD–470–1972, "IEEE Standard Application Guide for Bolometric Power Meters" and IEEE–STD–474–1973, "IEEE Standard Specifications and Test Methods for Fixed and Variable Attenuators, DC to 40 GHz." Other standards and test methods would be added in the future, as requested, if they meet the requirements of the NVLAP procedures.

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